PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

Donna Creek Forestry/Biodiversity Project: Methods of 1996 Breeding Bird Investigations: Point Count Surveys, Cavity Nest Searches, and Cavity Nest Habitat Characterization

R. van den Driessche and J. Joy
April 1998

PWFWCP Report No. 247

105-02310/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: R. van den Driessche and J. Joy. April 1998. Donna Creek Forestry/Biodiversity Project: Methods of 1996 breeding bird investigations: point count surveys, cavity nest searches, and cavity nest habitat characterization. Peace/Williston Fish and Wildlife Compensation Program, Report No. 247. 12pp plus appendices.

Author(s): Ruth van den Driessche[1] and Jeffrey Joy[1]
Address(es): [1] Pacific Slope Consulting, 598 Millstream Lake Rd., RR6, Victoria, B.C. V9B 5T9

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 METHODOLOGY 2

2.1 Point Count Surveys 2

2.1.1 Census Point and Transect Re-Marking 2

2.1.2 Sampling Chronology 2

2.1.3 Methods of Point Count Surveys 3

2.1.4 Point Count Habitat Characterization 4

2.2 Cavity Nest Searches and Nest Monitoring 4

2.2.1 Cavity Nest Searches 4

2.2.2 Cavity Nest Monitoring 6

2.2.3 Nest Site Characterization 6

3.0 SUMMARY OF 1996 OBSERVATIONS 8

3.1 Point Count Surveys 8

3.2 Cavity Nest Searches 9

4.0 LITERATURE CITED 11

1.0 INTRODUCTION

The Donna Creek breeding bird surveys are a component of the Donna Creek Forestry/Biodiversity Project being conducted by the Peace/Williston Fish and Wildlife Compensation Program. Three forested blocks in the Donna Creek drainage were selectively harvested in 1991 and 1992. Patches of timber (tree islands) and 3 metre tall stumps (stubs) were retained in different combinations and are being monitored to determine if they provide important wildlife habitat components for cavity dependent birds and furbearers (Wood 1992, Wood 1994).

The study design included a total of six cutblocks and three old-growth areas. Tree islands and stubs were retained in different combinations throughout each of three treatment blocks (5516, 5546, 5547). Each treatment block was partitioned into four approximately equal sections based on presence or absence of each factor. In one section, 8 to 10 stubs per hectare were retained (Stub treatment: SB). In another section, 0.25 ha tree islands were left at a density of one per eight hectares, with stubs left around the patch perimeters (Tree Island treatment: TI). In the third section, a combination of 8 to 10 stubs per hectare, and 0.25 ha tree islands were left (Stubs and Islands treatment: SI). The last section was a traditional clearcut (Clearcut treatment: CT). Three other traditionally clearcut blocks (5510, 5549, 5550) served as clearcut controls (CC), and three old-growth forest areas (Old-growth control: OG) in timbered leave strips adjacent to the treatment cutblocks served as controls of undisturbed forest habitat.

Preliminary breeding bird surveys using the transect method were conducted in 1993 (Gyug and Summers 1995). The first of two consecutive years of point count breeding bird surveys took place in 1995 (Joy and van den Driessche 1995, Gyug 1996). Behavioural and habitat use surveys of cavity nesting birds also took place in the spring of 1995 (Joy and van den Driessche, *in prep A).* Cavity nest searches and evaluation, and the second year of point count surveys were conducted in the spring of 1996. This report documents the field activities conducted and the survey methodologies used to complete the 1996 point count surveys, cavity nest searches and habitat characterization of cavity nest sites. A brief summary of the 1996 survey results is also provided. A complete

analysis of the point count data is provided in Gyug (1997), analysis of the nest search data will be provided in a subsequent report (Joy and van den Driessche *in prep B*).

2.0 METHODOLOGY

2.1 Point Count Surveys

2.1.1 Census Point and Transect Re-Marking

In 1995, 149 permanent breeding bird survey stations were established in the six cutblocks and three old-growth areas in the Donna Creek study area, detailed locations of survey stations can be found in Joy and van den Driessche (1995).

The center of each survey station was uniquely identified in 1995 with a combination of angle iron stakes, tree tags, spray paint, and pink flagging tape. Fifty metre perimeters were marked with yellow flagging tape; travel routes between survey stations were marked with pink flagging tape. In 1996, the survey stations were re-marked using spray paint and flagging tape, and the 50 metre perimeter markers and travel routes were re-flagged.

2.1.2 Sampling Chronology

Point count surveys were completed within the active breeding season (May 29 to July 4). Sampling took place between dawn and 09:30 hours, and did not take place during rain or heavy wind.

Each point count station was surveyed seven times - with every point being surveyed once before the next replicate began (Table 1). The seven replicates were distributed throughout the breeding season ensuring representative sampling of birds arriving early and late to their breeding grounds in the Donna Creek study area. During the first six rounds, the two observers alternated visits to each of the 149 point count stations, visiting each station three times each. Following the sixth round, a few days prior to the expected fledging dates for cavity nesting birds, point count surveys were interrupted for 5 days (June 25 to June 29) to enable nest searches to be conducted during

the peak activity period in the early morning. Point counts resumed after the cavity nesting birds began to fledge (June 30). The final replicate of point count surveys was split between the two observers.

With two individual observers, an early dawn, and closely spaced points an average of 30 to 35 points were completed per morning, with a maximum of 40 points per morning.

Table 1. Timing of the 1996 breeding bird point count surveys in the Donna Creek study area.

Replicate 1	May 29 ------> June 2
Replicate 2	June 2 ------> June 7
Replicate 3	June 7 ------> June 12
Replicate 4	June 12 ------> June 16
Replicate 5	June 16 ------> June 20
Replicate 6	June 21 ------> June 24
Replicate 7	June 30 ------> July 4

2.1.3 Methods of Point Count Surveys

The 1996 point counts survey methodology followed methods used in 1995 (Joy and van den Driessche 1995). Each of the 149 point count stations was surveyed for 10 minutes and all birds heard or seen were recorded on data forms (Appendix 1). Before beginning tree island and old-growth points, a one-minute settling period was allowed. Surveying at all other stations began upon reaching the point count station edge in order to include birds flushed from the survey area during approach (Hutto et al. 1986).

The 50 metre perimeter of point count stations situated within tree islands often fell outside the tree island boundary. Bird detections noted outside the tree island were differentiated from those recorded within the tree island. This was accomplished by drawing the island boundary on the point count data sheet and recording the observation site in the correct location.

2.1.4 Point Count Habitat Characterization

Peace/Williston Fish and Wildlife Compensation Program biologists characterized habitat variables at different levels around point count plots (Peace/Williston Fish and Wildlife Compensation Program unpublished data). We assisted with a portion of the data collection around the old-growth and tree-island point count stations by recording the number, diameter at breast height (DBH), height class, and wildlife tree class (visual assessment only) of all snags and stubs within a 25 metre radius of plot centre.

2.2 Cavity Nest Searches and Nest Monitoring

2.2.1 Cavity Nest Searches

Cavity nest searches consisted of locating active nests and evaluating the structural and ecological characteristics of the nest sites. Nests were located using five different methods: systematic searches, call playbacks, intensive local searches, stub assessments and incidentally during point count surveys. The following details the protocol of these five methods:

1. **Call Playbacks Searches:** From May 29 to June 11 (before woodpecker eggs began to hatch), one observer carried a portable tape machine and played pre-recorded woodpecker calls at approximately 100 metre intervals throughout the three treatments and block perimeters. The other observer followed the systematic search protocol (see below), walking 50 metres away. Additional woodpecker calls were played in the immediate vicinity of tree islands and each tree island was searched intensively for signs of cavity nesting birds. Tapes contained territorial calls and drumming of hairy woodpeckers, three-toed woodpeckers, black-backed woodpeckers and northern flickers. Prerecorded calls of each species lasted approximately 20 seconds. Calls were played in random species order and not every species was played at each stop. If a response was obtained, we followed the woodpecker until it was either lost or a nest was found. Call playback searches differed only from systematic searches in that a tape was played to elicit a response from resident woodpeckers. Call

playback searches occurred between 10:00 and 15:00 hours with even sample effort in each of the SB, TI and SI treatments and additional effort in the block perimeters (approximately one hour per treatment and an additional two hours to walk the block perimeter). Each treatment block was visited at least three times for call playback searches.

2. **Systematic Searches:** From June 12 to June 24, we looked for signs of cavity nests (cavities in trees, stubs, or snags; wood chips at the base of trees; observing adult birds, listening for the begging calls of juvenile birds). Walking approximately 50 metres apart, we systematically searched throughout the SB, TI and SI treatments with each observer searching approximately half of each treatment. For searches of tree islands, observers were spaced much closer than the 50 metres used outside the tree islands, and searches were more intensive. An entire treatment was completed before the next treatment was started. The perimeter of the blocks (the surrounding old-growth edge) were treated as one search area. We searched the perimeter by walking 10 metres either side of the cutblock boundary. Protocol of perimeter searches varied. Typically observers split up, each walking half of block perimeter, but on occasion the two observers walked the block perimeter together. Nest searches followed morning counts, taking place from 10:00 to 15:00 hours. Each treatment block was visited 4 times with even sample effort spent in each of the SB, TI, and SI treatment types (approximately one hour per treatment type and an additional two hours along the block perimeter).
3. **Intensive Local Searches:** From June 25 to June 29 when young were vocal and nests were more easily located, we searched for nests from dawn until 10:00 hours. Searches concentrated on areas where a high number of cavity nesting birds had been recorded during point counts in OG, SB, TI and SI treatments and block perimeters, and did not follow any systematic sample protocol. Intensive local searches consisted of following adult birds until they were either lost or a nest was located and/or listening for the vocalizations of young inside nest cavities. One search could take anywhere up to 3 hours, and was not always successful. These intensive local searches were also conducted on days when rain or wind interrupted breeding bird surveys.

4. **Stub Assessments:** In June and July, as part of the stub decay assessment portion of the Donna Creek Forestry/Biodiversity Project, each three metre stub in blocks 5516, 5546 and 5547 was visited by Peace/Williston Fish and Wildlife Compensation Program staff. The presence of cavities was recorded and these sites were provided to us for further examination and monitoring.
5. **Incidentally:** Nests were also located incidentally during the point count surveys in all three treatments and old-growth control areas (May 29 - July 4). This included watching birds fly to nesting cavities during the surveys and while walking between survey stations in all treatment and control areas. Nest locations were noted for future monitoring.

2.2.2 Cavity Nest Monitoring

All potential nest cavities were investigated. If a nest cavity was identified as inactive, it was checked again later on an ad hoc basis to confirm its status. Active cavity nests were checked at four-day intervals, and as often as once per day during fledging periods (June 26- July 8). Each active nest was initially accessed using a ladder or climbing equipment and viewed using a dental mirror and small flashlight to determine egg and/or nestling numbers. Nest monitoring began as soon as nests were found and continued until nestlings had fledged or the nest had been predated. Nests were monitored by listening for the calls of the young inside the cavity. Where possible, we monitored nests during the point count survey period while traversing between survey stations. If nests were not on the survey route or if nests were silent, nest status was evaluated after point counts surveys were completed. Once nests were empty, cavities were inspected for signs of predation (Appendix 2b).

2.2.3 Nest Site Characterization

In 1996, we characterized the nest site of all active 1995 (Joy and van den Driessche 1995) and 1996 nests at three levels: nest-tree surroundings, nest tree structure,

and nest cavity. Nest site characterization took place after the young had fledged from the nest between June 25 and July 8, 1996.

Nest tree surroundings

To characterize the area surrounding the nest sites, vegetation and biophysical descriptions were collected within macroplots centred on the nest tree.

Within a 50 metre radius macroplot, slope, aspect, elevation, macrosite position, site series (type and percent coverage) and number of stubs (in the SB and SI treatments only) were evaluated (Appendix 2a).

Within 25 metres of all active cavity nests, we noted the number, dbh, and height class of all stubs and snags. If the cavity nest was located in OG or TI treatment, a wildlife tree class assessment (visual only) was done for all surrounding snags. A visual assessment of all stubs surrounding cavity nests in the islands in the TI treatment was also obtained.

Within an 11 metre radius plot, site series, moisture regime, and surface substrate were identified. Percent cover of vegetative species was recorded in 6 strata following protocols outlined in Procedures for Environmental Monitoring (Habitat Monitoring Committee 1990). We measured the percent cover of mosses and lichens, herbs, low shrub, tall shrub, sub-canopy trees, and canopy trees. We recorded the number of stumps (from cut trees), root wads, and wildlife trees (>15 cm DBH) to provide an index of potential perching, feeding, and/or nesting sites (Appendix 2a).

Amount (number of pieces), size (diameter and length), and decay class of coarse woody debris were measured along two right angle 24-metre transects centred from the nest tree. Sampling methods followed draft guidelines developed for measuring coarse woody debris by the Vegetation Resources Inventory (British Columbia Ministry of Forests 1996) (Appendix 2a).

Nest Tree Structure

An active nest tree was any structure that housed an active cavity nest: stub, snag or live tree. For each active nest tree, we recorded tree species, DBH, and signs of decay

(Appendix 2b). Internal signs of decay were evaluated from an increment bore core sample of heartwood and sapwood. External signs of decay and deformities (conks, heartrot, broken tops, frost cracks, broken branch holes, scars) were also recorded. Heart rot decay fungi were identified from fruiting bodies where possible (Allen et al. 1996). Percentage bark remaining on the nest tree was visually estimated. Wildlife Tree Classification was based on overall appearance of nest tree, root condition, sapwood condition, heartwood condition and percent remaining bark (Guy and Manning 1994). Tree height was measured using a clinometer and tape measure. DBH was measured with a diameter tape.The distance that a nest tree was from the cutblock perimeter or a tree island was visually estimated.

Nest Cavity

At each active cavity, we recorded cavity characteristics after the young had fledged. We accessed cavity nests using a ladder or climbing equipment (ropes, slings and harness) to take the following measurements. The entrance dimensions (length and width) were measured to the nearest 0.1 cm with a ruler. Cavity depth was measured using a fishing weight on a line lowered into the cavity. Cavity orientation was measured using a compass with the base placed against the cavity entrance. Cavity height was measured using a measuring tape held at the base of the cavity entrance and dropped to the ground. Diameter of the nest tree at cavity height was measured using a diameter tape (Appendix 2b). We accessed sixteen of the eighteen cavity nests by ladder or climbing equipment, two nest trees were determined too unsafe to climb.

3.0 SUMMARY OF 1996 OBSERVATIONS

3.1 Point Count Surveys

Arrival of migrant birds and the breeding cycle of nesting birds appeared to be delayed which may have been a result of the heavy snowpack and delay in snow melt. Sampling was interrupted by rain on 7 days and by wind on one day. Despite a delayed

and relatively wet spring, a total of 58 species were recorded during point count surveys, three less species than 1995 (Joy and van den Driessche 1995). However, the total number of species recorded from surveys and incidental observations in the Donna Creek study area was 77 in 1996 (Appendix 3), one less than the 78 species recorded in 1995.

Species of particular note in 1996 included a northern hawk owl *(Surnia ulula)* that was observed using a tree island in the SI treatment of block 5546 (point station SI3). The owl was observed perched in the tree island for 34 consecutive minutes on the top of a main canopy tree. In addition, northern pygmy owls *(Glaucidium gnoma)* were frequently heard calling from the old-growth forest surrounding the treatment blocks, and one was recorded at a point count station in the OG control adjacent to block 5516.

3.2 Cavity Nest Searches

Eighteen cavity nests were located in the Donna Creek study area, in 1996. Woodpeckers occupied 10 nests and passerines occupied 8 cavities (Table 2). Active cavity nests were found in three treatment types: SB = 5 nests, TI = 3 nests, SI = 5 nests. Seven nests were built in tree islands. Active cavity nests were also located in old-growth timber (2 nests in old-growth control and 2 nests in mature timber of block perimeters). The clearcut control block 5549 contained an active cavity nest in the only 3 metre stub present in the block. Eleven cavity nests were found in subalpine fir *(Abies lasiocarpd)*, six cavities were found in Engelmann spruce *(Picea engelmanii)*, and one in lodgepole pine *(Pinus contorta)*.

Three black-backed woodpecker nests found in 1996 were situated in the same three cavities used by the same species in 1995 (Table 2). Three-toed woodpeckers excavated fresh nest cavities in 1996. Three-toed woodpeckers chose the same stub for nesting in 1995 and 1996 but the nest cavities were located 40 centimetres apart.

Some cavities were used by different species between years. A 1995 black-backed woodpecker nest was occupied by a mountain bluebird in 1996. A northern flicker moved into a natural cavity in a tree island previously used by a mountain bluebird in 1995.

Table 2. A summary of active cavity nest sites found in the Donna Creek study area during 1996.

Treatment Type abbreviations: *SB* - Stub treatment; *TI* - Tree Island treatment; *SI* - Stubs and Tree Island Treatment; *CC* - Clearcut control; *OG* - Old-growth control; *T* - areas of mature timber surrounding cutblocks and outside the old-growth control areas; * indicates nest was found in a tree island.

Cavity Use: *1995 & 1996* - nest active in both years, no information on when nest was constructed, *1996P* - primary cavity nest, constructed and active only in 1996; *1996S*- secondary cavity nest, cavity was built prior to 1996 and active in 1996, not in 1995.

Occupant: *Multiple* - indicates more than one species occupied cavity in 1996 and cavity will appear twice in this table; *Different* - different species occupied cavity in 1996 than in 1995; *Same* - the same species occupied cavity in 1995 and 1996.

Nest Plot Number	Block Number	Treatment Type	Species	Nest Structure	Cavity Use	Occupant
16NP04	5516	SB	Black-backed woodpecker	Stub	1995 &1996	Same/Multiple
16NP04	5516	SB	Tree swallow	Stub	1995 &1996	Same/Multiple
16NP05	5516	TI*	Mountain bluebird	Snag	1995 &1996	Different
16NP06	5516	SI	Mountain bluebird	Stub	1995 &1996	Same
16NP07	5516	SI*	Northern flicker	Snag	1995 &1996	Multiple
16NP07	5516	SI*	Mountain bluebird	Snag	1995 &1996	Same/Multiple
16NP09	5516	OG	Three-toed woodpecker	Snag	1996P	
16NP10	5516	SB	Black-backed woodpecker	Stub	1995 &1996	Same
16NP11	5516	SB	Tree swallow	Stub	1996S	
46NP05	5546	OG	Three-toed woodpecker	Snag	1996P	
46NP06	5546	T	Three-toed woodpecker	Snag	1996P	
47NP03	5547	TI*	Tree swallow	Snag	1995 &1996	Different
47NP04	5547	T	Three-toed woodpecker	Snag	1996P	
47NP05	5547	SI*	Black-backed woodpecker	Snag	1995 &1996	Same
47NP06	5547	SB	Mountain bluebird	Stub	1995 &1996	Same
47NP08	5547	SI*	Three-toed woodpecker	Stub	1996P	
47NP09	5547	TI*	Three-toed woodpecker	Stub	1996P	
49NP02	5549	CC	Mountain bluebird	Stub	1995 &1996	Different

4.0 LITERATURE CITED

Allen, E., D. Morrison, and G. Wallis. 1996. Common tree diseases of British Columbia. Canadian Forest Service. Victoria, B.C. 178 pp.

British Columbia Ministry of Forests. 1996. Coarse woody debris. Section 5 in Sampling Procedures Manual, Vegetation Resources Inventory. Draft Version April 19/96.

Campbell, R.W. 1990. Birds. Pages 27-37 *in* R.A. Cannings and A.P. Harcombe (Eds) The Vertebrates of British Columbia: scientific and english names. Royal British Columbia Museum Heritage Record No. 20 and Wildlife Branch Wildlife Report No. R24.

Guy, S., and E.T. Manning. 1994. Wildlife/danger tree assessor's course workbook. Canada British Columbia Partnership Agreement on Forest Resource Development in B.C. Ministry of Forests. Victoria, B.C. 84 pp + appendices.

Gyug, L.W., and K. Summers. 1995. Donna Creek Forestry/Biodiversity Project: Preliminary breeding bird surveys (1993). Peace/Williston Fish and Wildlife Compensation Program Report #41. 45 pp + appendices.

Gyug, L.W. 1996. Donna Creek Forestry/Biodiversity Project: Breeding bird point counts 1995. Peace/Williston Fish and Wildlife Compensation Program Report #53. 30 pp + appendices.

Gyug, L.W. 1997. Donna Creek Forestry/Biodiversity Project: Breeding bird point counts 1995 and 1996. Peace/Williston Fish and Wildlife Compensation Program Report No. 129. 40pp plus appendices.

Habitat Monitoring Committee. 1990. Procedures for environmental monitoring in range and wildlife habitat management Section 4.5. Ministry of Environment and Ministry of Forests, Victoria, B.C. pp G1-G11.

Hutto, R.L., S.M. Pletschet, and P. Hendricks. 1986. A fixed-radius point count method for nonbreeding and breeding season use. Auk 103: 593-602.

Joy, J., and R. van den Driessche. 1995. Donna Creek Forestry/Biodiversity Project: Spring 1995 breeding bird surveys: Summary Report. Peace/Williston Fish and Wildlife Compensation Program Report No. 44. 4 pp + appendices.

Joy, J., and R. van den Driessche. *In prep. A.* Donna Creek Forestry/Biodiversity Project: Habitat use of cavity nesting birds in the Donna Creek study area, 1995. Prepared for Peace/Williston Fish and Wildlife Compensation Program, Prince George, B.C.

Joy, J., and R. van den Driessche. *In prep. B.* Donna Creek Forestry/Biodiversity Project: Nest site selection by cavity nesting birds in the Donna Creek study area, northcentral British Columbia. Prepared for Peace/Williston Fish and Wildlife Compensation Program, Prince George, B.C.

Wood, M.D. 1992. Donna Creek Biodiversity Project (Cavity Nester Habitat Selection): Progress report, 1992/1993. Peace/Williston Fish and Wildlife Compensation Program Report No. 19. 8 pp + appendices.

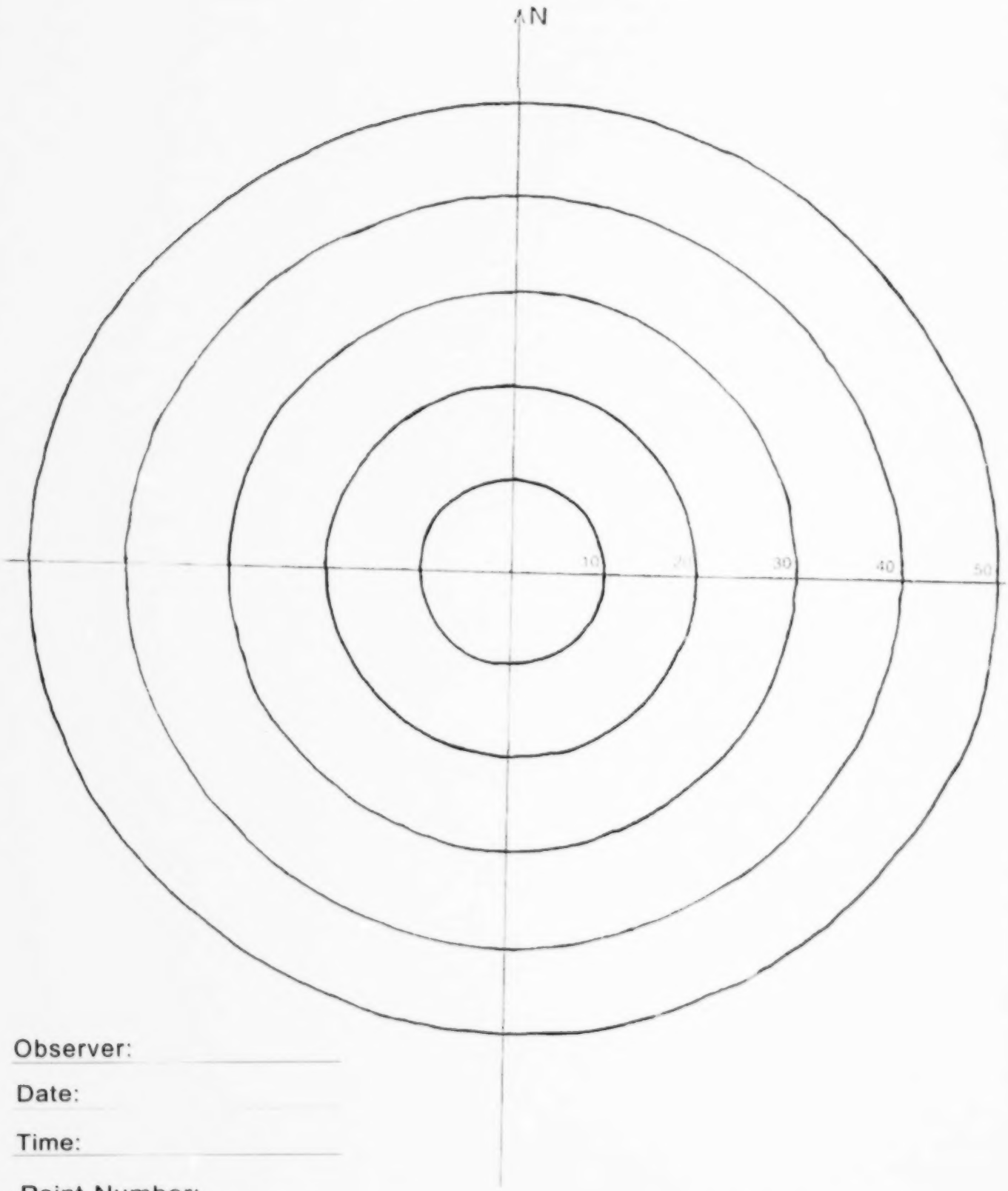
Wood, M.D. 1994. Donna Creek Biodiversity Project: Progress Report, 1993/1994 and 1994/1995. Peace/Williston Fish and Wildlife Compensation Program Report No. 37. 7pp.

APPENDIX 1: Point Count Data Sheet and Coding

Point count survey data fields for assessing relative abundance of breeding birds:

Block	Cutblock number (e.g., 5510)
Treatment	Treatment type (e.g., CC)
Point Number	Number of point sampled (e.g., 1)
Census Replicate	Replicate number
Time	Time point commenced (e.g., 04:15)
Date	Date sampled (Year/Month/Day)(e.g., 96/06/15)
Observer	Observer initials (e.g., JBJ)
Species Code	Bird species recorded (cf., Campbell 1990; e.g. solitary sandpiper- SOSA)
Activity Code	S=singing, C=calling, V=visual, N=nesting, O=overflight, M=moving, D=drumming
Habitat Feature	Habitat element being used (e.g., stub, small conifer, slash, stump, snag, tree island, coarse woody debris)

Donna Creek Breeding Bird Surveys 1995



Observer: _____

Date: _____

Time: _____

Point Number: _____

APPENDIX 2: Cavity Nest Monitoring and Site Characterization Forms

A) Nest Site Surroundings Forms:

Plot Physical Form (50 metre and 11 metre)
Vegetation Form (11 metre)
Coarse Woody Debris Forms (24 metre transects)

B) Nest tree and nest cavity characteristics

Nest Site Data Sheet
Nest and Nest Structure Form

PLOT PHYSICAL CHARACTERISTICS

Plot No.: _____ Recorders: _____ Date: _____

INFORMATION FROM 11 m PLOT:

Site Series: _____ Moisture Regime: _____

Surface Substrate -total must equal 100%

Decaying Wood	Bedrock	Cobbles/stones	Mineral Soil	Organic Matter	Water

Stumps - average diameter measurement

< 10 cm	10 - 19 cm	20 - 29 cm	30 - 39 cm	40 -49 cm	50 -59 cm	≥60cm	Total

Root Wads - average diameter measurement

< 1 m	1 - 1.9m	2 - 2.9m	> 3m	Total

Snags - only measure snags ≥ 15 cm dbh (note only total number if < 15 cm dbh)

DBH	Sp.	Ht.	WTC

DBH	Sp.	Ht.	WTC

DBH	Sp.	Ht.	WTC

Height (Ht.) classes - 1 [<5 m], 2 [5-9.9 m], 3 [10-19.9 m], 4 [>20 m]

INFORMATION FROM 50 m PLOT:

Slope: _____ % Aspect: _____ ° Elevation: _____ m Site Position: _____

Site Series (type & %): _____ Moisture Regime: _____

Stub No.: _____

Comments:

Province of British Columbia
Ministry of Forests
Ministry of Environment

SERI

VEGETATION DESCRIPTION FORM (EM-3)

(FOR USE WITH THE "PROCEDURES FOR HABITAT MONITORING MANUAL")

Name Number

DATE Y M PROJECT ID

SURVEYOR BEC NO MAP No. UTM

STRATUM		A C	A1	A2	A3	A	B	B1	B2	C
FIELD NAME OR COLLECTION #	ENTRIES GENUS	SPEC	P	P	D	V	P	P	D	V	P	P	D	V	P	P	D	V	P	P	D	V	P	P	D	V	P	P	D	V

COARSE WOODY DEBRIS DATA

Plot No.: Recorders: Date:

Size Class	Transect #1 (°)							
	LI	DC	LC	%S	LI	DC	LC	%S
7.6 to 19.9 cm								
20 to 29.9 cm								
30 to 39.9 cm								
40 to 49.9 cm								
50 to 59.9 cm								
>60cm								

Size Class	Transect #2 (°)							
	LI	DC	LC	%S	LI	DC	LC	%S

LI - line intercept distance (cm), DC - decay class (1 to 5; see decay description page), LC - length class (1 to 4; see below), %S - percent sound wood (see below)

Length class (LC) - **1** [<5 m], **2** [5 - 9.9 m], **3** [10 - 19.9 m], **4** [≥20 m]
Sound wood (%S) - **100** [100%], **75** [75-99%], **50** [50-74%], **25** [25-49%], **1** [1-24%], **0** [0%]

Comments:

Nest Site Data Sheet

Species using nest/cavity: _____

Date: _____ Aspect: _____

Time: _____ Slope: _____

Surveyor: _____ Site Description: _____

Treatment: _____

Nest Type:

- Cup
- Scrape
- Cavity
- Hanging Pocket
- Other _____

Nest Location

- Ground
- Shrub
- Log
- Stub
- Tree
- Snag

Tree Characteristics:

- Species _____
- DBH _____ centimetres
- Canopy Density _____ (Sparse, Moderate, Dense)
- Decay Stage _____ (Alive, Recently dead, Advanced)
- Height _____ metres

Nest Position on Tree/Shrub:

Top 1/3 Middle 1/3 Bottom 1/3

Distance from Axis of Tree/Shrub: _____ metres

Cavity Type:

Natural Primary Secondary

Estimated age of cavity _____ yrs Number of cavities in tree _____

Canopy Cover Class of Nest/Cavity:

- No cover
- Some cover
- Moderate cover
- Thick to opaque cover
- Description of covering material _____

Description of surrounding vegetation:

Nest Characteristics

Species using nest/cavity

Shortest distance to edge of treatment_____metres

Description of nest and building materials:

Description of Cavity:

Cavity measurements:

Entrance diameter:

Horizontal Vertical

Maximum Depth:

Cavity Monitoring:

Visit #1: Date:_____

# of Eggs/Nestlings_____

Comments:

Visit #2: Date:_____

# of Eggs/Nestlings_____

Comments:

Visit #3: Date:_____

# of Eggs/Nestlings_____

Comments:

Nest Site Data Sheet

Species using nest/cavity: _____

Date: _____ Aspect: _____

Time: _____ Slope: _____

Surveyor: _____ Site Description: _____

Treatment: _____

Nest Type:
- Cup
- Scrape
- Cavity
- Hanging Pocket
- Other_____

Nest Location
- Ground
- Shrub
- Log
- Stub
- Tree
- Snag

Tree Characteristics:

Species _____

DBH _____ centimetres

Canopy Density _____ (Sparse, Moderate, Dense)

Decay Stage _____ (Alive, Recently dead, Advanced)

Height _____ metres

Nest Position on Tree/Shrub:

Top 1/3 Middle 1/3 Bottom 1/3

Distance from Axis of Tree/Shrub:_____metres

Cavity Type:

Natural Primary Secondary

Estimated age of cavity_____yrs Number of cavities in tree_____

Canopy Cover Class of Nest/Cavity:
- No cover
- Some cover
- Moderate cover
- Thick to opaque cover
- Description of covering material _____

Description of surrounding vegetation:

APPENDIX 3:

Species recorded in the Donna Creek study area during the 1996 breeding season.

Boldface: Species recorded during 1996 point count surveys (58 species).

Nonbold-face: Additional species recorded incidentally outside of the point count surveys but still within the Donna Creek drainage.

1. Canada Goose *(Branta canadensis)*
2. Mallard *(Anas platyrhnchos)*
3. Green-winged Teal *(Anas crecca)*
4. Ring-necked Duck *(Aythya collaris)*
5. Barrow's Goldeneye *(Bucephala islandica)*
6. Killdeer *(Charadrius vociferus)*
7. **Solitary Sandpiper** ***(Tringa solitaria)***
8. **Spotted Sandpiper** ***(Actitis macularia)***
9. **Common Snipe** ***(Gallinago gallinago)***
10. Bald Eagle *(Haliaeetus leucocephalus)*
11. Sharp-shinned Hawk *(Accipiter striatus)*
12. Red-tailed Hawk *(Buteo jamaicensis)*
13. **American Kestrel** ***(Falco sparverius)***
14. **Spruce Grouse** ***(Dendragopus canadensis)***
15. **Blue Grouse** ***(Dendragopus obscurus)***
16. **Northern Pygmy Owl** ***(Glaucidium gnoma)***
17. **Northern Hawk Owl** ***(Surnia ulula)***
18. Rufous Hummingbird *(Selasphorus rufus)*
19. **Northern Flicker** ***(Colaptes auratus)***
20. **Hairy Woodpecker** ***(Picoides villosus)***
21. **Three-toed Woodpecker** ***(Picoides tridactylus)***
22. **Black-backed Woodpecker** ***(Picoides arcticus)***
23. **Olive-sided Flycatcher** ***(Contopus borealis)***
24. **Western Wood Pewee** ***(Contopus sordidulus)***
25. Say's Phoebe *(Sayornis saya)*

26. **Dusky Flycatcher** ***(Empidonax oberholseri)***

27. **Hammond's Flycatcher** ***(Empidonax hammondii)***

28. **Least Flycatcher** ***(Empidonax minimus}***

29. **Alder Flycatcher** ***(Empidonax alnorum)***

30. **Western Flycatcher** ***(Empidonax difficilus)***

31. **Tree Swallow** ***(Tachcineta bicolor)***

32. Barn Swallow *(Hirunda rustica)*

33. **Steller's Jay** ***(Cyanositta stelleri)***

34. **Gray Jay** ***(Perisoreus canadensis)***

35. **Common Raven** ***(Corvus corax}***

36. Mountain Chickadee *(Parus gambeli)*

37. **Boreal Chickadee** ***(Parus hudsonicus)***

38. **Red-breasted Nuthatch** ***(Sitta canadensis)***

39. **Brown Creeper** ***(Certthia americana)***

40. **Winter Wren** ***(Troglodytes troglodytes)***

41. **Golden-Crowned Kinglet** ***(Regulus satrapa)***

42. **Ruby-Crowned Kinglet** ***(Regulus calendula)***

43. **Mountain Bluebird** ***(Sialia currucoides)***

44. **Townsend's Solitaire** ***(Myadestes townsendi)***

45. **Swainson's Thrush** ***(Catharus ustulatus)***

46. Hermit Thrush *(Catharus guttatus)*

47. **Varied Thrush** ***(Ixoreus naevius)***

48. **American Robin** ***(Turdus migratorius)***

49. **American Pipit** ***(Anthus rubescens)***

50. **Cedar Waxwing** ***(Bombycilla cedrorum)***

51. **Warbling Vireo** ***(Vireo gilvus)***

52. **Tennessee Warbler** ***(Vermivora peregrina)***

53. **Orange-crowned Warbler** ***(Vermivora celata)***

54. **Yellow-rumped Warbler** ***(Dendroica coronata)***

55. **Townsend's Warbler** ***(Dendroica townsendi)***

56. **Blackpoll Warbler** ***(Dendroica striata)***

57. **Yellow Warbler** ***(Dendroica petechia)***

58. **MacGillivray's Warbler** ***(Oporornis tolmiei)***

59. **Wilson's Warbler** ***(Wilsonia pusilla)***

60. **Northern Waterthrush** ***(Seiurus novoboracensis)***

61. Common Yellow-throat *(Geothlypis trichas)*

62. **American Redstart** ***(Setophaga ruticella)***

63. **Savannah Sparrow** ***(Passerculus sandwichensis)***

64. Song Sparrow *(Melospiza melodia)*

65. **Chipping Sparrow** ***(Spizella passerinus)***

66. **Dark-eyed Junco** ***(Junco hyemalis)***

67. **White-crowned Sparrow** ***(Zonotrichia leucophyrs)***

68. **Golden-crowned Sparrow** ***(Zonotrichia atricapilla)***

69. Fox Sparrow *(Passerella iliaca)*

70. **Lincoln Sparrow** ***(Melospiza lincolnii)***

71. **Brewer's Blackbird** ***(Euphagus cyanocephalus)***

72. Western Tanager *(Piranga ludoviciana)*

73. **Pine Siskin** ***(Carduelis pinus)***

74. **Red Crossbill** ***(Loxia curvirostra)***

75. **Pine Grosbeak** ***(Pinicola enucleator)***

76. Purple Finch (Carpodacus purpureus)

77. **Evening Grosbeak (Coccothraustes vespertinus)**